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SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, MARK FREIER of Bissingerstr. 13, D-75038 Oberderdingen, Federal Republic of Germany, EBERHARD KÖRNER of Dieselstrasse 18, D-75015 Bretten, Federal Republic of Germany and HELMUT HECKELE of Lessingstr. 8, D-75438 Knittlingen, Federal Republic of Germany, all German citizens, have invented certain new and useful improvements in an ENDOSCOPIC SAMPLE TAKER FOR IN PARTICULAR CARTILAGE MATERIAL of which the following is a specification:

BACKGROUND OF THE INVENTION

The invention proceeds from an endoscopic sample taker for in particular cartilage material, according to the introductory part of the patent claim 1.

Such a sample taker is described in the German utility model 1 855 179. It consists of a hollow shank with an actuation rod axially adjustable therein, of a scoop pivotably arranged at the distal end of the hollow shank and of a scissor-like handle arranged at the proximal end of the hollow shank. This handle comprises an unmovable grip part which is rigidly fastened on the hollow shank, and a movable grip part which is pivotably connected to the unmovable grip part and engages the proximal end of the actuation rod. By actuating the movable grip part the scoop by way of the actuation rod is pivoted with respect to the hollow shank so that by way of pivoting forward and back the scoop, cartilage tissue, in particular of human joints, may be released by way of abrading. The abraded cartilage particles are removed from the body by rinsing out and are complicated and difficult to extract from the rinsing fluid in order to cultivate new and reimplantable cartilage mass from this. Furthermore it has proven to be award to remove the desired cartilage particles with the scoop alone from the joint or from another diseased cartilage region of a patient because the abraded cartilage particles on withdrawing the sample taker from the body cavity concerned are again to a great extent lost. A further disadvantage of this known sample taker lies in the fact that the scoop for the abrading procedure must be set considerably transversely and thus on account of its construction and for carrying out its function it requires considerable space in the body cavity of the joint or likewise.

Furthermore there are known biopsy forceps with one or two pivotable, hollow jaw parts for the secure removal of tissue samples. The jaw parts are located at the distal end of the hollow shank on whose proximal end there is provided a handle for actuating the jaw parts. These forceps are suitable essentially only for removing soft tissue and not for cartilage tissue or likewise, since this is considerably harder. Furthermore these jaw parts for carrying out their function also require much space because they must be spread apart transverse to the longitudinal direction of the hollow shank.

BRIEF SUMMARY OF THE INVENTION

The object of the invention lies in improving an endoscopic sample taker of the above mentioned type which with a low distal space requirement ensures a secure and quick removal of cartilage material from in particular human body cavities.

The solution of this object is specified in claim 1.

With this solution cartilage material may be unloseably removed in a secure and rapid manner from a cartilage location, e.g. from a knee joint of a patient in order to be able to be used for obtaining or cultivating new cartilage cell material which then is reimplanted at a damaged cartilage location in the body of the patient. After healthy cartilage material by way of abrading has reached the trough of the scoop from the desired cartilage location the trough by way of advancing the covering according to the invention is closed so that separated-off cartilage tissure on withdrawing the sample taker from the body of the patient may not get lost. A further advantage of the sample taker according to the invention lies in the fact that the covering for the trough of the scoop is arranged at the distal end of the sample taker in an extremely space-saving manner

and by way of this demands practically very little space particularly as it is located in the non-operational position in the retracted position in the hollow shank. Furthermore it is advantageous that the covering is to be simply manufactured with very low costs.

In one advantageous embodiment of the sample taker according to the invention the covering for the trough of the scoop consists of a metal tongue. In the case that the scoop is bent back at a certain angle with regard to the hollow shank, the covering consists of flexible material. With this it is advantageous that in the hollow shank there is provided an axially movable holding-down device in order to hold the covering on the scoop in the closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is hereinafter described in more detail by way of one embodiment example shown in the accompanying drawings. There are shown in:

Figure 1 a lateral view of the sample taker,

Figure 2 an axial section through the distal end region of the sample taker,

Figure 3 a part axial section through the sample taker according to Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

The sample taker indicated generally at 1 in Figure 1 comprises a hollow shank 1 with a scoop 2 which is rigidly and unreleasably fastened

on the distal end of the hollow shank, and a handling means 3 with an actuating mechanism 4. The scoop 2 comprises a spoon-like or shell-like trough 5 into which gets cartilage material, bone material or similar hard material is extracted from a body cavity of a living being, preferably a patient, this material being obtained by way of abrading. For this the scoop has a sharp edge 2a. In the hollow shank 1 there is located an actuation rod 6 on whose distal end there is fastened a tongue-shaped covering 7 for the trough of the scoop 2 (Figure 2). The material for the covering 7 is preferably thin metal. The covering may be formed strip-like and in its covering section have a circumferential shape which corresponds to the circumferential shape or essentially to the circumferential shape of the trough 5. At the same time it is essential that the trough 5 is sufficiently covered by the covering 7 so that the gained cartilage material on retracting the sample taker 1 from the body cavity of the patient is not lost.

The scoop 2 may extend coaxially to the hollow shank 1. It is however also possible to provide the scoop running at a certain angle with respect to the hollow shank 1, as this is shown in Figures 1, 2 and 3. In this case the covering 7 consists of a bending-elastic material so that it automatically bends and adapts to the oblique running of the edge 3 of the scoop 2 when the actuation rod 6 is advanced. In order to ensure a secure guiding of the covering 7 on the scoop 2 it is advantageous to provide a holding-down device 8 which comprises a distal continuation 8a which with the scoop 2 determines a gap 9 for guiding the covering 7. The holding-down device 8 may consist of a cylinder section unreleasably fastened in the shank 1 or may form a part of the shank 1. The actuation rod 6 with the covering 7 for its axial displacement is guided by the holding-down device. With the continuation 8a of the holding-down device 8 it is also achieved that the covering 7 pushed over the trough 5, over the scoop 2 is held in the closure position.

In a further advantageous embodiment the front edge 10 of the covering 7 may be formed as a cutter 10 in order to simplify a separation of cartilage tissue or likewise.

For the axial actuation of the actuation rod 6 with the covering 7 there is provided an inclined handling means. This means is not the subject-matter of the invention and is therefore described only briefly.

The hollow shank 1 with the scoop 2 and the actuation rod 6 with the covering 7 form a dismountable construction unit which is releasably connected to the handling means 3. The means comprises a hand grip 11 with a distal sleeve section 12 as a component of the actuating mechanism 4. Onto the sleeve section 12 there may be screwed a screw sleeve 13 in order to fasten the proximal end part 14 of the holding-down device 8 in the sleeve section 12. Furthermore a union nut 15 is screwable onto the proximal end of the end component 14 in order to fasten the hollow shank 1 on the means 3.

The mechanism 4 comprises further an external cylindrical ring 17 arranged axially displaceable on the sleeve section 12 and an inner cylindrical ring 18 rigidly fastened within the sleeve section 12 on the actuation rod 6, as well as a fastening bar 19. The bar 19 passes through the rings 17 and 18 as well as an axial elongate hole 20 of the sleeve section 12. Furthermore the bar 19 is adjustable according to the double arrow 21.

The bar 19 has furthermore a suitable receiver 22 for the positive-fitting insertion of the proximal end of the actuation rod 6. Furthermore in the inner cylindrical ring 18 of the mechanism 4 there is provided a ball-lock formation 23 in order to fix the bar 19 in the locking position and in a release position. In Figure 3 the ball-lock formation 23 is shown in its locking position.